VEGETABLES FOR THE HOT, HUMID TROPICS

Part 5. Eggplant, *Solanum melongena*

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PREFACE

In the hot, humid Tropics, torrential rains during the monsoon season create special hazards for agriculture. Lands are muddied or flooded, entrance to plantings is restricted, weeds grow vigorously, chemicals applied are washed from the plants, and fertilizer is leached from the soil. High water tables drive oxygen from the soil, diseases thrive above and within the soil, and many plants are uneconomical to cultivate. These conditions make food production difficult, and agricultural skills imperative.

During tropical rainy seasons, the problem of producing highly nourishing food still exists. For the most part, the solution is to select appropriate species and varieties and know how to grow and utilize them in both conventional and unconventional ways.

Tropical diets are often unbalanced not only because of ignorance of sound dietary principles and because of food prejudices, but also because of a lack of good species and varieties. The Tropics are exceedingly varied in this respect, but knowledge is inadequate almost everywhere. Furthermore, even when appropriate varieties are known, it is often difficult to obtain seeds.

The purpose of this series of bulletins is to furnish information about vegetables that can be grown in the hot, humid Tropics. The vegetables covered are either not well known, at least with respect to some uses, or not well distributed, but are productive during tropical rainy seasons. The techniques recommended can be applied on a small scale or with a low level of technology. Seed sources are suggested when necessary.

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VEGETABLES FOR THE HOT, HUMID TROPICS

Part 5. Eggplant, *Solanum melongena*

By Franklin W. Martin and Bernard L. Pollack[1]

INTRODUCTION

Eggplant is a common vegetable in diets throughout the Tropics. For the most part, it is popular neither because of its taste, which is neutral or even unpleasant to some people, nor because of its nutritional value, which is only moderate, but because eggplant is relatively easy to grow and is attractive. Garden eggplant, *Solanum melongena* L., is the most popular of the many species of *Solanum* that bear nonsweet, nonacid vegetable-type fruits. The popularity of eggplant and its use in varying the diet make eggplant one of the most important vegetables for the hot, humid Tropics.

BOTANY

Taxonomy

Eggplant belongs to the genus *Solanum*, family Solanaceae, a large genus with species that extend over the Tropics and the Temperate Zone. In addition to *S. melongena*, the eggplant of both temperate and tropical zones, several African and Indian species are also called eggplants (see later). However, these other species prob-

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ably constitute only a small fraction of the eggplants used, except perhaps in parts of West Africa.

There is no evidence of any differentiation of eggplant into botanical subspecies. Practical classifications have often been made for convenience. In India, Choudhury (2)[2] recognizes the following varieties: *insanum*, small-fruited prickly types; *esculentum*, round or egg-shaped fruits; *serpentinum*, long, narrow fruits; *deperssum*, dwarf, early varieties. However, all degrees of intermediate types occur. Even the primitive varieties are copied by numerous small-fruited, spiny types.

Probably the oldest common name for eggplant is brinjal, used in India, and varied there in many ways. In Spanish, berenjena, from the Arabic, al berenjena, is the most common, and aubergine is used in France. Berenjena means apples of love in Arabic. The name "eggplant" probably originated in reference to the first varieties introduced into Europe with white, egg-shaped fruits.

Origin and Distribution

Eggplant is an ancient crop in India and most likely originated there. Secondary centers of diversity where eggplant has been introduced and has probably evolved include China and possibly Africa. Wild varieties (small, much branched, with thorny foliage and many small fruits) are found west of Bengal, India (fig. 1).

Eggplant was introduced into China before the fifth century and was carried by Chinese traders throughout Southeast Asia. Arabs introduced eggplant to Europe. The vegetable probably reached Spain in the 13th century. The Persians are thought to have taken it to Africa.

Eggplant is now widely distributed in the Temperate Zone and in the Tropics. Breeding for locally adapted varieties has resulted in a wide diversity of the germplasm. Hundreds of varieties are known in Russia. In the United States, varieties of large, black, pear-shaped fruits have been developed. Throughout the Mediterranean region and the Near East, varieties are numerous and diverse in morphology. In Europe, eggplant is now produced in heated greenhouses. Eggplant occasionally escapes from cultivation and tends to revert to spiny, small-fruited forms after several generations.

Growth Habit and Morphology

Eggplant is an annual herb with a slight tendency towards perennialism. In the Tropics, the majority of plants die during the

[2]Italic numbers in parentheses refer to items in "Literature Cited" at the end of this publication.

FIGURE 1.—Wild eggplant, thorny with small fruits.

first year of growth, but death is almost always associated with disease. Cuttings can be made of healthy branches and rooted to perpetuate a given plant for many years. Old plants, if cut back, will frequently resprout and bear in a second year. Eggplant can therefore be thought of as a faculative annual.

Eggplants vary greatly in form of growth. Whereas primitive forms are often low and spreading, plants of good varieties in the Tropics often reach 2 meters in height. A very large limb may be bent to the ground by the weight of the fruit, but stems tend to be rigid. Terminal and lateral branches are indeterminate in growth.

The foliage is often spiny. Spines can occur on the stems, petioles, leaves, pedicels, and calyces. These spines vary from short, deltoidal

FIGURE 2.—Multiple fruit clusters of eggplant.

prickles to long, narrow, sharp needles. In addition to spines, the foliage is covered with a gray tomentum consisting of short, stellate hairs.

The root system is characterized by a strong, often branched tap root and a deep, fibrous root network.

Leaves are alternate, simple, usually large (up to 40 centimeters in length), and irregularly lobed and undulate along the margin. The base is rounded or cordate and the tip obtuse to acute.

Flowers are borne singly or in clusters of up to seven. The first flower in each cluster is normal, and subsequent flowers often have abnormal, shortened stigmas, or none at all. These flowers seldom are fertile, although unusual varieties can be found bearing as many as three or four fruits in a cluster (fig. 2). The flower is composed of complete, regular petals united into a radiate tube, lobed about one-fourth of the distance, with five to seven partially united calyx segments. Five or six stamens with short filaments and relatively long anthers are grouped in a column around a central style with slightly capitate stigma. Petals vary in color from white to dark violet. The ovary is usually two-loculed.

As the fruit grows, the pedicel elongates, and the calyx develops into a persistent fleshy structure. Fruits vary from long and

FIGURE 3.—Variations in eggplant fruit.

serpentine to short and almost discoidal (fig. 3). Large fruits are often slightly lobed because of the two or more locules. The coloring is complex. Fruits may be devoid of color (white) or green. Superimposed on this color are many degrees of purple pigmentation. The green and purple pigments may be distributed evenly, or in blotches, streaks, or shoulders. The intensity of the purple and probably the

FIGURE 4.—*Solanum integrifolium*, showing egg-shaped fruits.

green is sometimes related to exposure to light. The shaded areas under the sepals are sometimes colored differently from the rest of the fruit. As the fruit matures, color changes to yellow or bronze.

The seeds are small, discoidal, smooth, and light brown.

Genetics and Breeding

The chromosome number of the eggplant is 24, a common diploid number in the Solanaceae. All varieties tested have been self-fertile. Reports of heterostylic self-incompatibility in eggplant are based on a

FIGURE 5.—Large, fasciate fruits of *Solanum macrocarpon*.

false interpretation of the malformed flowers found in *Solanum*. This developmental abnormality may result from a competition of flowers for available nutrients, or a suppression of growth of the second and later flowers by the first.

Eggplant is normally self-pollinated. Self-pollination occurs without the intervention of insects. Flowers attract some species of bees, and these sometimes result in cross-pollination. Rates of cross-pollination from 6 to 20 percent have been reported (3). Cross-pollination does not occur between plantings separated by only 50 meters.

Thus, the typical eggplant variety is a more or less uniform, homozygous pure line best bred and improved by traditional methods. It withstands inbreeding and pure-line selection.

The occurrence of hybrid vigor has been reported. This vigor is not surprising, for hybrids of carefully selected varieties can combine the favorable characteristics of the parents. Heterosis measured as the improvement of yield over the parental mean yield has been reported to be 80 to 100 percent in a few cases (3).

Disease resistance is an important objective in the breeding of new varieties. Some of the principal diseases for which resistance is available are bacterial wilt (*Pseudomonas*), leaf spot (*Alternaria*), and virus or mycoplasma attacks. Insects to which eggplants have been reported resistant are the fruit borer, *Leucinodes orbonalis*, and aphids (5). Nematode resistance (*Meloidogyne* spp.) has been found in *Solanum sisymbrifolium*. A chief center for eggplant breeding is the Indian Agricultural Research Institute, New Delhi, India.

In Japan, the species *S. integrifolium* (fig. 4), an African eggplant, has been crossed with the typical eggplant. This species and the related *S. macrocarpon* (fig. 5) might be useful species for new characteristics for eggplant. Most other species of *Solanum* cannot be crossed with eggplant.

In India and in West Africa, considerable studies of the population genetics of eggplant have been undertaken, including the mode of inheritance of various characters and the possibilities of improvement by breeding.

VARIETIES

The varieties of eggplant are numerous. A few special varieties and their sources and characteristics are given in table 1. Resistance to bacterial wilt has been a principal breeding objective. Other resistances are important in some local areas. Color, size, and shape of the fruit vary according to local market preferences.

RELATED EDIBLE SPECIES

The authors estimate that between 75 and 100 species of *Solanum* are grown for their edible leaves or fruits. Many of these resemble eggplants in appearance and in usage. The most important species and a few facts are given in table 2 [see also Jardin (*4*)]. This list does not include South American species grown for their dessert-type fruit.

The most important of the minor species is probably *S. integrifolium* (fig. 4), which exists as numerous wild and land varieties. This species has been considerably improved by selection

TABLE 1.—*Special varieties of eggplant*

Variety	Geographical source	Remarks	Known disease resistances
'Aroman'			Bacterial wilt.
'Aranguez'	Trinidad	Very large green fruits.	
'Black Beauty'	U.S.A.	Old, standard, large-fruited variety.	
'Black Magic'		Early, hybrid.	
'Black Torpido'	Japan	Excellent shape, hybrid.	
'Bulacan'	Philippines	Few seeds	Bacterial wilt.
'Ceylon SM 164'	Sri Lanka		Bacterial wilt.
'College Long Purple'	Philippines	Improvement of above.	
'Dingras Multiple Purple'	Philippines	Fruits inclusters	Bacterial wilt.
'Fengyuan Purple'	Taiwan	Traditional variety.	
'Florida Market'	U.S.A.	Excellent market type	Phomopsis rot.
'Florida Highbush'	U.S.A.	Excellent market type.	
'Fort Meyers'	U.S.A.	Excellent market type	Phomopsis rot.
'Kopek'	Java		Bacterial wilt.
'Long Purple'	Philippines	Traditional variety.	
'Madinina'	Japan		Bacterial wilt.
'Matale'	Sri Lanka		Bacterial wilt.
'Muktaheshi'	India	Traditional, excellent for Tropics.	
'Nihon Nassu'	Japan		Bacterial wilt.
'Pingtung Long Red'	Taiwan	Traditional variety.	
'Porcelaine'	West Indies	Large white fruits.	
'Pusa Kranti'	India.		
'Pusa Purple Long'	India	Long, narrow fruit.	
'Pusa Purple Round'	India	Large, ovate fruit.	
'Pusa Purple Cluster'	India	Several fruits per cluster.	
'Rosita'	Puerto Rico	Long lived, excellent yields	Bacterial wilt.
'Sinampiro'			Bacterial wilt.
'Zebrina'	Spain	Striped.	

and is a good prospect for wider introduction and testing. Both bitter and nonbitter forms are known, and all are appreciated. *S. gilo* (fig. 6), with its almost spherical fruits, is also an excellent vegetable. The leaves of these species are also eaten.

In spite of its *poisonous* characteristics, *Solanum nigrum* is grown in the Tropics for its edible leaves as well as its ripe fruits. This polymorphic species exemplifies the problem with *Solanum* species in general. *They may be* ***poisonous****, and their* ***poisonous*** *character varies among races, with time, and with plant part.* Casual experimentation with the edible and poisonous characteristics of *Solanum* species cannot be recommended. Although many of its relatives are poisonous, the eggplant has never been shown to be harmful.

(*Continued on page 12.*)

TABLE 2.—Solanum *species used as vegetables in various parts of the Tropics*

Scientific name	Common name	Areas where used	Edible parts	Notes
Solanum aculeastrum Dunal	Omotugunda	Uganda, Kenya,	Fruit.	
S. aethiopicum L.	Mock tomato	Tropical Africa	Short, young fruit.	Bitter.
S. anomalum Thonn.	Children's tomato	Tropical Africa	Dried fruit	Condiment.
S. dasyphyllum Schum. et Thonn.		Tropical Africa	Leaves, fruit.	
S. erythracanthum Boj. ex Dun.		Angiuy	Madagascar	Leaves, fruit.
S. gilo Raddi		Gabon, Nigeria	Young fruit, young shoots.	Cooked.
S. ferox L.		Southern Asia	Young fruit	Cooked.
S. incanum L.	Bitter tomato	Tropical Africa, Madagascar.	Leaves, young fruit.	Cooked, some forms *poisonous*.
S. indicum L.	Children's tomato	India, Southeast Asia, Tropical Africa.	Fruit	Ripe or unripe, cooked.

S. integrifolium L.	Garden egg	Tropical Africa	Leaves, fruit	Unripe, cooked.
S. macrocarpon L.	African eggplant	Tropical Africa, Madagascar.	Leaves, fruit	Looks like tomato.
S. monteiroi C. H. Wright.		Angola	Fruit.	
S. nigrum L.	Black nightshade	West Africa	Leaves, shoots, fruit.	Some forms *poisonous*.
S. nigrum L. var. *nodiflorum* Jacq.	Lumbush	Tropical Africa	Leaves, fruit	Some forms *poisonous*.
S. nigrum L. var. *oleraceum* Dunal		Madagascar	Leaves	Very popular.
S. olivare Pailleux et Bois.		Tropical Africa	Fruit.	
S. radiatum Sendt.		Tropical Africa	Leaves.	
S. seaforthianum Andr.	Tree tomato	Madagascar	Fruit	Looks like tomato.
S. snoussii A. Chev.		Central Africa	Leaves.	
S. terminale Forsk. ssp. *sanaganum* Heine		Central Africa	Leaves.	
S. terminale Forsk. ssp. *welwitschii* Heine		Central Africa	Leaves.	
S. torvum Sw.		Tropics	Unripe fruit.	

FIGURE 6.—*Solanum gilo* with edible leaves and fruits.

CULTIVATION

Climatic Requirements

Eggplant is a warm-season vegetable adapted for year round use in the Tropics, and for the summer only in the Temperate Zone. Eggplant is more tolerant of hot night temperatures than tomato but is also produced in the Temperate Zone almost until first frost. Optimal day temperature has been given as 25° to 35° C, and optimal

night temperature as 20° to 27° C (2, 5). Eggplant is also highly tolerant to drought and to excessive rainfall, making it one of the most widely adapted of tropical vegetables. As a rule, however, fruit set and production drops with high temperature or rainfall.

Eggplant is apparently not sensitive to day-length differences. It can grow and flower freely year round. It is seldom grown as a perennial although it can be if cut back to force new growth.

Soils and Soil Preparation

Eggplant is not highly specific in its soil requirement. Although probably best adapted to fairly fertile well-drained loams, eggplant can be found in the Tropics in sandy soils, where it grows well until nematode damage becomes excessive, and in heavy clays where its roots are often waterlogged. When waterlogged, plants tend to die early from soil-borne diseases. The best range of soil pH for eggplant is 5.5 to 6.8.

Conditions for best growth include high fertility, established in some areas by high applications of manure (20 to 25 tonnes per hectare). In a small garden, perhaps 5 centimeters of manure should be applied to the soil surface and mixed in. If mineral fertilizers are used, about 1,500 kilograms per hectare of a 10–10–10 formula is recommended (about 75 grams per plant). Eggplants need high quantities of phosphorus, intermediate quantities of nitrogen, and small quantities of potassium. Eggplants can be harvested over a long period, and several applications of mineral fertilizer may be required.

Where heavy rains are expected, eggplants are planted on raised beds. Where drought is the rule, they are planted in furrows. Recommended spacing is from 45 to 120 centimeters between plants. In most parts of the Tropics where growing seasons are long, 90 to 100 centimeters between plants is about right.

Seeding and Transplanting

There are 200 to 250 eggplant seeds in a gram. A hectare requires 375 to 500 grams of seed. In the Tropics, seeding is generally done 6 to 8 weeks before the rainy season begins, but plantings can be made at any time. Seeds are generally planted in carefully prepared seedbeds consisting of a mixture of sand, loam, and organic material. Initial growth is enhanced and healthier plants are obtained if the soil is sterilized. If this is not done, care should be taken to avoid overwatering, which results in fungal diseases. Furrows not more than 1 centimeter deep are spaced about 10 centimeters apart. The seeds are placed in the furrows more or less touching each other and covered with sand or soil mix. The soil is pressed flat and watered.

Eggplant seeds need up to 2 weeks to germinate, and they often germinate irregularly. A few hours' exposure of dried seeds before

planting to temperature of 4° to 6° C is said to stimulate germination. The seedbeds must be protected from excess moisture and from drying out during this period. When the plants show 2 or 3 leaves, about 14 days after germination, they are usually transplanted to seed flats or beds, with about 8 to 10 centimeters between plants. Six to eight weeks after being transplanted, they are ready for the field. They should be exposed to outdoor conditions several days to harden them for field planting. This conditioning should include gradually increased exposure to sunlight and drying out.

In the Tropics, eggplants can be propagated by rooting of healthy shoots, easily done by placing a pot of soil beneath the shoot while still attached to the plant. This technique is also good for the home garden.

The well-plowed soil already furrowed or formed into beds should be wetted several days in advance to avoid planting in dry soil. The plants are distributed along the line of planting at the distance required and planted with a short-handled hoe. Machines are also adapted to this process. As soon as possible, a starter solution of 200 milliliters should be applied to the new transplants. A complete mineral fertilizer (such as 100 grams potassium nitrate and 200 grams ammonium phosphate per 100 liters) is dissolved in water. The beds are usually thoroughly irrigated soon after planting. Wilting of the new transplants should be avoided.

In the Tropics, eggplants are frequently grafted to a vigorous *Solanum* species such as *S. torvum*. Nematodes are avoided in this fashion, and plants can produce for a year or more.

Postplanting Care

Newly established plantings need care to insure good production. Young plantings are often sprayed with appropriate, approved chemicals to avoid fungi and to control insects. Such sprays should not be used before problems appear. Also, because of variations from country to country in laws governing the use of pesticides, local authorities should be consulted for information on chemical-control techniques and on current, local laws affecting the use of pesticides and other chemical-control measures. Irrigation by sprinkler, by furrow, or by hand should be sufficient.

Weed control should be shallow to avoid damage to eggplant roots. Weeds should never be allowed to get out of control, and the ideal is to never permit weeds to seed in cultivated fields. Tillage should not be done more often than necessary to destroy weeds. Approved herbicides may be available in some areas for weed control of eggplants. Where labor is cheap, tillage between the rows with shallow plows pulled by animals and by hoe between the plants is reasonable. Eggplants can be mulched to reduce moisture loss.

TABLE 3.—*Common diseases of eggplant in the Tropics and suggested control measures*

Disease	Organism	Symptoms	Suggested control[1]
Bacterial wilt	*Pseudomonas solanacearum*	Wilting and yellowing beginning below. Sap a yellowish color.	Resistant varieties, clear culture, rotation.
Phomopsis rot	*Phomopsis vexans* (Diaporthe).	Stem, leaf, and fruit spots and cankers.	Resistant varieties, long rotations, maneb[2] or zineb.[3]
Anthracnose	*Gloeosporium melongenae*	Yellow of fruit, suntan spots.	Use healthier seed remove and destroy infected fruit and leaves.
Verticillium wilt.	*Verticillium* spp.	Wilt, lower leaves, yellow-brown vascular tissue.	Resistant varieties, long rotation, soil fumigation with ethylene dibromide.
Little leaf	A mycoplasm	Small leaves	Root dip with approved substance.
Mosaic	A virus	Mosaic on leaves	Remove diseased plants.

[1]These chemical-control measures are registered for use in the United States. Because control practices vary from country to country, local regulations and suggested control practices should be sought in every case.

[2]Manganous ethylenebis [dithiocarbamate].

[3]Zinc ethylenebis [dithiocarbamate].

Either dried plant materials or thin black polyethylene sheets are practical. Mulches are also effective in reducing weed problems.

Additional fertilizer given during growth will vary according to local conditions. Eggplants are heavy feeders, and they benefit from sidedressing with a mineral fertilizer two or three times after planting.

Under favorable conditions, eggplants in the field will begin to flower and fruit 6 to 8 weeks after transplanting. Although fruits can be used even when only one-fourth of their potential size, they should be large but unripe (two-thirds to three-fourths full size) for harvest and marketing. Harvesting should be done about once a week. A good yield is 25 to 50 tonnes per hectare.

An eggplant planting is maintained as long as it is economical to do so. Part of the field may be rejuvenated by cutting back healthy unproductive plants and by stimulating new growth with fertilizers.

PESTS AND DISEASES

Eggplant is fairly trouble free in the Tropics, but pests and diseases do occur on all plants. Some of the diseases are given in table 3. The most important diseases in most areas are bacterial wilt and

TABLE 4.—*Insects and other pests that attack eggplant in the Tropics*

Common name	Scientific name	Symptoms or notes	Suggested control[1]
Root-knot nematodes.	*Meloidogyne* spp.	Root galls	Soil treatment, resistant varieties.
Eggplant lace bug	*Gargaphia solani*	Fine yellow spots	Biological controls exist; carbaryl,[2] malathion.[3]
Aphids	*Aphis* spp.		Malathion.[3]
Spider mites	*Tetranychus* spp.	Very fine spots, mites beneath leaf.	Malathion.[3]
Leafhoppers	Various	Yellowing, wilting drying of leaf edges.	Carbaryl.[2]
Flea beetles	*Epitrix* spp.	Shot holes in leaves	Carbaryl.[2]
Termites	Various species	Roots and stems eaten	Physical destruction of nests.
Fruit borer	*Leucinodes orbonalis*	Fruit and shoot damage.	Removal of parts affected, long rotations, heat treatment (50° C) of seeds.

[1]These chemical-control measures are registered for use in the United States. Because control practices vary from country to country, local regulations and suggested control practices should be sought in every case.

[2]1-Naphthyl methylcarbamate.

[3]Diethyl mercaptosuccinate *S*-ester with *O,O*-dimethyl phosphorodithioate.

Phomopsis rot. The former is the most frequent cause of dieback in established plants. The latter is the most annoying, for it destroys the value of the fruit. In both cases, resistant varieties are available, but local races to which such varieties are not resistant may occur. Note that nonchemical controls include destruction of diseased materials and rotation of crops. In some areas, specific chemical controls may be available.

Insects and other pests commonly found on eggplant are included in table 4. Control practices should be learned from local authorities. Chemical-control practices registered in the United States may be unsuitable for some parts of the Tropics, and may possibly be illegal.

POSTHARVEST CONSIDERATIONS

Storage and Use

Eggplants can be stored for up to 10 days at a high (85 to 90 percent) relative humidity and a medium-low (10° to 13° C) temperature. At lower temperatures, injury by chilling occurs, and the eating quality of the fruit decreases.

The uses of eggplant are varied. Young uncooked fruits are cut fine and used in curries. Unripe uncooked fruits are also marinated in

TABLE 5.—*Nutritional value of cooked eggplant*

Component	Amount per 100 grams[1]	Male adult daily requirement[2]	Percentage of RDA
Volume ..... cup	½	. . .	. . .
Water ..... g	94.3	. . .	. . .
Energy ..... cal	19	2,700	0.7
Principal nutrients:			
Carbohydrates ..... g	4.1	. . .	. . .
Fat ..... g	0.2	. . .	. . .
Protein ..... g	1.0	56	1.8
Minerals:			
Calcium ..... mg	11	800	1.4
Iron ..... mg	0.6	10	6.0
Phosphorous ..... mg	11	800	1.4
Potassium ..... mg	150	. . .	. . .
Sodium ..... mg	1	. . .	. . .
Vitamins:			
A ..... IU	10	1,000	1.0
Ascorbic acid ..... mg	3	45	6.7
Niacin ..... mg	0.5	18	2.8
Riboflavin ..... mg	0.04	1.6	2.5
Thiamine ..... mg	0.05	1.4	3.6

[1]Adams (*1*).
[2]National Research Council (*6*).

vinegar and spices. Fruits can be sliced and boiled or steamed for a few minutes. In the western world, the eggplant is most often used as a material that is enriched by other ingredients to give it flavor. Strips or slices are dipped in batter and fried. Fruits are hollowed and stuffed with mixtures of other ingredients or with spiced cubes of the fruit itself. A wide variety of recipes exists for baking eggplant with sauces.

Because cooked eggplant is soft, it is often recommended in folk medicine for stomach ulcers, colitis, and constipation.

Nutritional Value

The nutritional value of eggplant is low (table 5). A 100-gram (half-cup) serving does not contain even 10 percent of the daily requirement of any nutrient. It is a fair source of vitamin C and iron and a poor source of the B vitamins. On the other hand, other *Solanum* species often contain poisonous alkaloids in small to large quantities. Although the fruits of eggplant are believed free of alkaloids, the leaves may not be. Probably the eggplant is safer than common related species freely eaten and harmless to most people, such as tomato, pepper, and potato.

FUTURE PROSPECTS AND RECOMMENDATIONS

Eggplant will continue to be a popular vegetable in the Temperate Zone and in the Tropics. Nevertheless, its role will always be limited unless steps are taken to change it. With the wide variety of eggplants already available, it should be possible to select cultivars for greater nutritional value. In particular, it should be possible to increase the protein content and the vitamin C by breeding. It should also be possible to breed into such eggplants resistance for the most destructive diseases of the hot, humid Tropics, bacterial wilt and Phomopsis rot. It should also be possible to obtain eggplants with edible leaves. Probably, this would involve the elimination of the pubescence of this species and possibly a reduction of the alkaloid content. Edible leaves, although hardly a marketable product in many parts of the Tropics, will increase the use of eggplant in the home garden and raise the overall nutritional contribution of the plant. The future of eggplant can be bright.

On the other hand, there is also a potential for the development of relatives of the eggplant. Perhaps the best of these are *Solanum gilo*, *S. macrocarpon*, and *S. integrifolium*, in that order. The fruits of *S. gilo* are already an excellent vegetable, and it may indeed be more versatile than eggplant. The leaves are glabrous and edible. Careful investigation of these species is necessary to realize their potentials.

LITERATURE CITED

(1) Adams, C. F. 1975. Nutritive value of American foods in common units. U.S. Dep. Agric., Agric. Handb. 456, 291 pp.

(2) Choudhury, B. 1967. Vegetables. 214 pp. National Book Trust, New Delhi, India.

(3) ———. 1971. Research on eggplants in India. Ford Foundation/IITA/IRAT Seminar on Vegetable Crops Research, Ibadan, Nigeria.

(4) Jardin, Claude. 1967. List of foods used in Africa. 320 pp. Food and Agriculture Organization of the United Nations, Rome.

(5) Knott, J. E., and Deanon, J. R., Jr. 1967. Vegetable production in Southeast Asia. 366 pp. University of the Philippines, Los Baños, Philippines.

(6) National Research Council. 1974. Recommended dietary allowances. 8th ed. The Council, Washington.

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